

**REMARKS**

Entry of the foregoing, re-examination and reconsideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111, and in light of the remarks which follow, are respectfully requested.

In the present Amendment, claim 1 has been amended to recite utilizing a spinneret to allow a controlled flow of a liquid, a vapor or a gas along an exterior medium of the nascent fiber. This amendment is supported by the disclosure, for example, page 11, lines 24-26. Claim 1 has also been to further improve its form. Claim 3 has been amended to correct a typographical error inadvertently introduced in a previous Amendment, by replacing "s" with --ε--. This amendment is also supported by the specification, for example, page 8, lines 22-23. Claims 6 and 8 were previously canceled. No new matter has been added.

Upon entry of the Amendment, claims 1-5, 7 and 9-35 will be all the claims pending in the application.

**I. References**

It is noted that the Examiner has relied on U.S. Patent No. 5,786,428 to Arnold et al., U.S. Patent No. 3,493,497 to Pretorius et al., and U.S. Patent No. 3,344,177 to Hensley et al. in the rejections. However, these references have not been cited in Form PTO-1449 or PTO-892 of record. The Examiner is respectfully requested to cite these references in a Form PTO-892 and return a copy to Applicants in the next official communication.

**II. Response to Rejections under 35 U.S.C. § 102(b)**

Claims 1-3, 6, 7, 9-22, 25-32 and 34 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,093,197 to Howard et al., as evidenced by the "EPA Technical

Bulletin on Zeolite." Applicants respectfully submit that the present claims are novel and patentable over the cited references for at least the following reasons.

Howard et al. discloses a process for forming fibers or filaments comprising extrusion of a mixture of polyolefin, filler and plasticizer from a die, to form fibers or filaments, and extracting at least a portion of the extractable plasticizer *afterwards*, to provide the desired porosity (Abstract; col. 1, lines 63-68). As explained at col. 3, lines 47-51 of Howard et al., the "extraction" serves to impart porosity to the fiber by at least partially removing the plasticizer material *after* fiber formation.

It is noted that Howard et al.'s process for forming a porous fiber involves two separate steps, i.e., an extrusion step and a subsequent extraction step. In essence, Howard et al.'s process is analogue to that of WO 98/34977 as described at page 2, lines 15-20 of the present specification. As such, the presently claimed process is distinguishable from Howard et al. by providing a simplified process in which porosity is achieved in a single extrusion step. There is no need for a subsequent extraction or stretching step any more (see page 4, lines 1-2 of the present specification).

The Office Action appears to assert that Howard et al. discloses providing porosity *during* extraction, relying on the description at col. 5, lines 38-60 of Howard et al. (page 4, lines 2-9 from the bottom).

Applicants wish to point out that Howard et al. discloses in the cited passages, directing a hot gas stream against the extrudate at an angle designed to *attenuate* the filaments or fibers being extruded. Attenuation has, however, little to do with porosity. This is for instance exemplified by col. 5, lines 61-62 of Howard et al., where attenuation is accomplished by mechanical tension. Moreover, Howard et al. describes at col. 5, lines 65-66, that "*It is*

*preferred to perform attenuation of filaments after the filaments have been subjected to the extraction step."*

Furthermore, present claim 1 recites utilizing a spinneret to allow a controlled flow of a liquid, a vapor or a gas *along an exterior of the nascent fibre*, which reflects a parallel flow of the liquid, vapor or gas. Applicants submit that an embodiment involving directing a hot gas stream *at an angle* as described in Howard et al. does not constitute parallel coextrusion.

Howard et al. refers in Examples 1 and 7 to the die according to U.S. Patent No. 3,947,537. It is submitted that Figures 1 and 2 in combination with the description at col. 2, lines 32-35 and 50-52 of US '537 show that parallel coextrusion of a stream next to the nascent fiber is not achieved. Howard et al. and US '537 focus on attenuating the extrudate at the die opening.

The Office Action also refers to the description at col. 6, lines 45-50 of Howard et al. (page 4, line 2 from the bottom – page 5, line 2). Applicants wish to point out that this passage deals with the extraction step which, as detailed above, only takes place after formation of the fibers, and is thus different from formation of porous *fibers* in a singular extrusion step.

In summary, Howard et al. does not teach or suggest providing porosity to a *nascent* fiber; rather, it teaches first forming a fiber, and then inducing porosity (by removing or “extracting” a component present in the fiber already formed). The measures taken in Howard et al. to provide attenuation also do not accidentally lead to the formation of porous fibers either, as discussed above. It requires parallel flow to establish porosity in a controlled manner. Otherwise, entering a coagulation bath would still lead to the formation of substantially closed fibers.

The EPA Technical Bulletin is cited against claim 22 merely as teaching that “zeolite can function as a strong acid when the hydration has substituted a hydrogen for the additional valence electron, or isoelectronic exchange with aluminum occurs” (page 7, last paragraph of the

Office Action). As the EPA Technical Bulletin does not rectify the above noted deficiencies of Howard et al., the combination of Howard et al. and the EPA Technical Bulletin still would not result in the subject matter of claim 1.

In view of the foregoing, Applicants respectfully submit that present claim 1 is novel and patentable over Howard et al., as evidenced by the EPA Technical Bulletin, and thus the rejection should be withdrawn. Additionally, claims 2, 3, 7, 9-22, 25-32 and 34 depend from claim 1, directly or indirectly, and thus are patentable over the cited references at least by virtue of their dependency.

### **III. Response to Rejections under 35 U.S.C. § 103(a)**

**a.** Claim 17 was rejected under 35 U.S.C. § 103(a) as being obvious over Howard et al. in view of the EPA Technical Bulletin.

Howard et al. is discussed above in Section II. The EPA Technical Bulletin is cited merely as synthesizing hydrophobic zeolite (page 10, 1st paragraph of the Office Action). As the EPA Technical Bulletin does not rectify the above noted deficiencies of Howard et al., the combination of Howard et al. and the EPA Technical Bulletin still would not result in the subject matter of claim 1, from which claim 17 depends indirectly. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

**b.** Claim 20 was rejected under 35 U.S.C. § 103(a) as being obvious over Howard et al. in view of U.S. Patent No. 5,786,428 to Arnold et al.

Howard et al. is discussed above in Section II. Arnold et al. is cited merely as disclosing separation systems which use adsorbent as the basis for conducting enantioresolution of optically active amino acids and peptides and methods for using the adsorbent (page 11, 2nd paragraph of the Office Action). As Arnold et al. does not rectify the above noted deficiencies of Howard et al., the combination of Howard et al. and Arnold et al. still would not result in the

subject matter of claim 1, from which claim 20 depends. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

c. Claim 21 was rejected under 35 U.S.C. § 103(a) as being obvious over Howard et al. in view of U.S. Patent No. 3,493,497 to Pretorius et al.

Howard et al. is discussed above in Section II. Pretorius et al. is cited merely as disclosing a chromatographic separation process which can be adapted to produce very rapid separations in a given system (page 12, last paragraph of the Office Action). As Pretorius et al. does not rectify the above noted deficiencies of Howard et al., the combination of Howard et al. and Pretorius et al. still would not result in the subject matter of claim 1, from which claim 21 depends. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

d. Claim 24 was rejected under 35 U.S.C. § 103(a) as being obvious over Howard et al. in view of U.S. Patent No. 6,454,943 to Koenhen.

Howard et al. is discussed above in Section II. Koenhen is cited merely as disclosing a self-supporting capillary membrane obtained by extruding the hollow fiber using an extruder and guiding the reinforcing fibers through a spinneret of the extruder (page 14, 2nd paragraph of the Office Action). As Koenhen does not rectify the above noted deficiencies of Howard et al., the combination of Howard et al. and Koenhen still would not result in the subject matter of claim 1, from which claim 24 depends. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

e. Claims 1-5 were rejected under 35 U.S.C. § 103(a) as being obvious over WO 02/43937 to Van Rijn et al. in view of Howard et al. Applicants respectfully submit that the present claims are novel and patentable over the cited references for at least the following reasons.

As a preliminary matter, it appears that claims 1, 3-5, 9, 11-13 and 29 are included in this rejection (pages 15-18 of the Office Action).

Van Rijn discloses that hollow fibres are most of the time produced by a spinning technique in combination with a phase separation process (page 27, line 19). Van Rijn further explains that the nascent fibre can be passed through an air gap (before phase separation) or can enter the bath immediately (page 27, lines 22 - 27). Either way, phase inversion only occurs upon immersion in the coagulation bath, i.e., simply in one step, and involves phase separation of the entire fibre.

Van Rijn does not disclose the initial controlled flow of a liquid, a vapor or a gas as an exterior medium of an initial phase separation, to obtain a porous exterior layer. Further, the passage at page 4, lines 6 - 10, which is cited by the Examiner, does not teach such controlled flow either. In the absence of such step, Van Rijn does not teach a process for producing fibres having particulate material entrapped and accessible after preparation.

Howard et al. is discussed above in Section II and does not teach the initial phase separation step to induce all-through porosity either. Therefore, the combination of Van Rijn and Howard et al. still would not result in the subject matter of present claim 1, from which claims 2-5 depend.

In view of the foregoing, Applicants respectfully submit that claims 1-5 are patentable over Van Rijn et al. in view of Howard et al., and thus the rejection should be withdrawn.

f. Claims 1, 2, 15 and 23 were rejected under 35 U.S.C. § 103(a) as being over U.S. Patent No. 4,302,509 to Coplan et al. Applicants respectfully submit that the present claims are novel and patentable over Coplan et al. for at least the following reasons.

Coplan et al. discloses explicitly that "the spun composite fibers are drawn and subsequently extracted to porosify the sheath and to activate the sorptive property of the cores"

(Abstract). Coplan et al. further discloses that after drawing, "the filaments are subjected to extraction for removal of the carrier forming the slurry ... and thereby to porosify the walls" (col. 3, lines 46-47 and 54-57).

Like Howard et al., Coplan et al.'s process for forming a porous fiber involves two separate steps, i.e., a drawing step and a subsequent extraction step. As such, the presently claimed process is distinguishable from Coplan et al. by providing a simplified process in which porosity is achieved in a single extrusion step. There is no need for a subsequent extraction or stretching step any more (see page 4, lines 1-2 of the present specification).

In view of the foregoing, Applicants respectfully submit that the present claims are patentable over Coplan et al., and thus the rejection should be withdrawn.

**g.** Claim 19 was rejected under 35 U.S.C. § 103(a) as being over Coplan et al. in view of U.S. Patent No. 3,344,177 to Hensley et al.

Coplan et al. is discussed above in Section III.e. Hensley et al. is cited merely as disclosing a purification method to obtain a substantially pure water insoluble aromatic dicarboxylic acid product from lower purity crude products (page 22, last paragraph of the Office Action). As Hensley et al. does not rectify the above noted deficiencies of Coplan et al., the combination of Coplan et al. and Hensley et al. still would not result in the subject matter of claim 1, from which claim 19 depends. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

**h.** Claim 23 was rejected under 35 U.S.C. § 103(a) as being over Howard et al., in view of WO 00/02638 to Boggs et al.

Howard et al. is discussed above in Section II. Boggs et al. is cited merely as disclosing membranes for removing organic compounds that have been added to a biological fluid which include a polymeric matrix and a particulate material immobilized within the matrix (page 23,

last paragraph of the Office Action). As Boggs et al. does not rectify the above noted deficiencies of Howard et al., the combination of Howard et al. and Boggs et al. still would not result in the subject matter of claim 1, from which claim 23 depends. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

**IV. Conclusion**

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at his earliest convenience.

Respectfully submitted,

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